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Environmental conditions and harvests in various fisheries for salmonids in Labrador, 2001

Conditions environnementales et prises réalisées dans le cadre des diverses pêches de salmonidés au Labrador en 2001

By / Par

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Abstract

Information was presented on catch statistics for Labrador in angling fisheries and aboriginal food fisheries in 2001 along with environmental data collected at gauging stations on selected rivers. Total return information was summarised from counting facilities. Total landings of 6,478 salmon weighing 16,288 kg were recorded for the food fisheries in Labrador. Landings recorded by the angling fishery were 1,929 small salmon retained, 5,401 small salmon released, 326 large salmon retained and 1,566 large salmon released. Water levels in Labrador rivers were high in the spring and low throughout most of the summer. Low water continued well into the fall.

Résumé

On présente des statistiques sur les prises de la pêche sportive et de la pêche autochtone à des fins alimentaires réalisées au Labrador en 2001, des données environnementales recueillies à des stations hydrométriques dans des rivières déterminées et un résumé des renseignements sur les remontes totales recueillis aux installations de dénombrement. Les pêcheurs autochtones ont déclaré des prises totales de 6 478 saumons, pesant 16 288 kg, tandis que les pêcheurs sportifs ont déclaré des prises de 1 929 petits saumons retenus, 5 401 petits saumons relâchés, 326 gros saumons retenus et 1 566 gros saumons relâchés. Le niveau d'eau dans les rivières du Labrador était élevé au printemps et faible pendant presque tout l'été, ce qui a été le cas jusque tard à l'automne.

INTRODUCTION

In 1992, several major changes were introduced to the management of Atlantic salmon in Newfoundland and Labrador. A five-year moratorium was placed on commercial salmon fishing in the island portion of the province, quotas for the Labrador commercial fishery, first introduced in 1990, were further reduced and a voluntary retirement of commercial salmon licences was instituted for all of the province. Beginning in 1997, the commercial fishery was closed in the Straits area of Labrador in Salmon Fishing Area (SFA) 14B and then in 1998, it was closed in the remaining SFAs 1 & 2 (Fig. 1). Fishers were offered a buyout which most accepted. In 1999-2001, a food fishery of 10 tonnes was available for members of the Labrador Inuit Association including Lake Melville, which is also in SFA 1. The Innu Nation fishes for salmon in Lake Melville and from the community of Davis Inlet and generally restrict themselves to harvests of around three tonnes. Beginning in 2000 and continuing into 2001, residents of Labrador were allowed to fish for trout with a permitted bycatch of four salmon. The west Greenland commercial salmon fishery, which was closed for the 1993 and 1994 fishing seasons, was re-opened in 1995 and closed again in 1999, leaving only a small subsistence food fishery in 2000. In 2001, the commercial Greenland fishery was opened with a structured quota system that depended on abundance based on in-season catches and historical averages to determine potential landings. Although there have been no recent tagging studies to document the distribution of Labrador salmon at sea, some Labrador origin multi-sea winter salmon may be caught in the Greenland fishery similar to what was shown for Labrador stocks in earlier studies by Pratt et al. (1974).

There are also harvests of salmon in the angling fishery in Labrador. In the angling fishery, in 1992 and 1993, a quota on the number of fish that could be retained was introduced. The quota was assigned for an entire SFA and was not administered on an individual river basis. Only hook-and-release fishing was permitted after the quota was caught. In 1994, quotas for the angling fishery were eliminated. In place of quotas, for Labrador, the season bag limit for retained salmon was lowered from eight to six fish, only two of which could be large salmon. In 1995 and 1996, the season bag limit for the angling fishery remained at six fish but only one large salmon could be retained. In 1999 and 2000, the angling fishery was restricted to a seasonal limit of four salmon retained, one of which could be large, and a daily limit of four salmon could be hooked-and-released. In 1999, use of barbless hooks became mandatory. In 2001, several additional rivers in southern Labrador crossed by the new Trans Labrador Highway were added to the list of scheduled rivers and restricted to individual bag limits of two small salmon retained.

The purpose of this paper is to document harvests of salmon in food and angling fisheries and to describe environmental conditions in Labrador in 2001.

METHODS

Angling fisheries

Catch and effort data from the angling fishery in northern (SFA 1) and southern Labrador (SFA 2) were collected by Department of Fisheries and Oceans (DFO) enforcement staff in conjunction with angling reports submitted by commercial sports camp operators and processed by DFO Science Branch (Fig. 1). Procedures for the collection and compilation of angling and commercial fishery data are described by Ash and O'Connell (1987). For purposes of separating 2SW salmon from 1SW salmon in angling fisheries, small salmon are defined as those salmon less than 63 cm and will be mainly 1SW (grilse) in age. Large salmon are those salmon equal to or greater than 63 cm and will be mainly 2SW and older in age.

In 1994, a new system, viz. the License Stub Return System (LSRS) was initiated for collecting angling statistics in Newfoundland and Labrador. It is based on attaching to the provincial angling licence a detachable stub upon which the angler can record details of where and when the fishing activity took place, and the numbers of salmon caught and released (O'Connell et al. 1998). Because of concerns over a lack of comparability of DFO angling statistics and the LSRS data, C&P staff and camp operator data will continue to be used for Labrador in SFAs 1 & 2. For SFA 14B rivers, the catch statistics for 1996-2000 were derived from the License Stub Return System. All 2001 year statistics are preliminary. Tags were issued to anglers that when attached to a salmon could be used to identify legally caught fish.

The Management Plan for the angling fishery in Labrador was as follows:

> Season: 15 June to 15 September
>
> Catch limits: four salmon per season, one of which can be large; except on Class III rivers where only two small salmon could be retained for the season
>
> Hook & release limits: four per day

Food fisheries

In 2001, there were three food fisheries for salmon in Labrador: 1 – LIA (Labrador Inuit Association) food fishery in Lake Melville and in the northern Labrador coastal communities of Rigolet, Makkovik, Hopedale, Postville, and Nain; 2 – Innu Nation food fishery in Davis Inlet and in Lake Melville from the community of Sheshatshiu; and, 3 – Labrador resident food fishery in Lake Melville and coastal communities in southern Labrador from Cartwright to Cape St. Charles. The LIA and Innu food fisheries were self-regulated by Aboriginal Fishery Guardians hired by these groups and the resident food fishery was regulated by DFO Fishery Officers and Guardian staff. For the LIA and resident food fisheries, tags for salmon were issued on an individual fisher basis to identify legally caught fish. Catch statistics were derived from logbooks issued to each fisher. The Innu Nation guardians collected catch statistics by maintaining a daily record of landings per family.

A summary of the year 2001 Management Plans for the three food fisheries as they pertain to salmon follows:

LIA

The Management Plan for the LIA food fishery was as follows:

Catch limits: up to ten salmon per licence, 10 tonnes of salmon for the season
Season: May 22 to July 10 and July 24 to August 19 in Lake Melville and June 1 to September 30 for coastal communities, although dates may vary by community within these time frames.

INNU NATION

The guidelines for the Innu Nation food fishery were as follows:

Catch limits: thirty per household with a 1,500 community total for the season.
Season: mid-June to end of 1st week of August and mid-June to end of July for Sheshatshiu in Lake Melville.

LABRADOR RESIDENT

Catch limits: four salmon per licence with a limit of 100 trout.

Season: July 15 to August 11 in southern Labrador, June 1 to July 1 and July 24 to 31 in Lake Melville and July 2 to August 31 in northern Labrador.

Total returns to rivers

Total returns to rivers in Labrador are available for six river systems and one tributary. Total returns have been previously reported by Lowe & Mullins (1996) for Forteau Brook and Mullins & Caines (1998) for Pinware River (updated by Mullins, pers. comm.), by Reddin et al. (1996) for Sand Hill River, by Reddin & Short (2000) for Big Brook, and by Reddin et al. (2000) for English River. Total returns to rivers include counts at counting fence traps plus downstream angling catches including estimates of hook and release mortalities, which are assessed at 10% of the number of salmon hooked and released.

Environmental data

Environmental data consisting of water flow conditions are collected annually from a system of gauging stations set on various rivers which are operated by Environment Canada. Several of these stations have automated data collection platforms with provision for downloading data via satellite. The Province of Newfoundland and Labrador through the Department of Environment and Labour is responsible for downloading the data and provides it in near-real time; albeit with no quality control. Data are archived by Environment Canada after quality control and made available from the Environment Canada Hydat CD-Rom for the period of record up to and including 1997. The 2001 data from the Provincial system was used. Flow data from Alexis,

Eagle and Ugjoktok rivers were selected to be representative of conditions on Labrador salmon rivers in 2001.

RESULTS & DISCUSSION

Angling fishery data

In SFA 1, the total catch (small and large salmon combined) of 1,238 decreased over 2000 by 16% (Table 1). In SFA 2, the total catch of 4,715 was 22% lower than in 2000 (Table 2). In SFA 14B, the total catch of 2,707 was similar to that of 2000 (Table 3). In 2001, the total Labrador angling catch in all SFAs was 9,222 salmon including hooked and released fish which was 16% lower than levels experienced in 2000 but remained higher than in previous years (Table 4). The catch of small salmon was 7,330 (1,929 retained and 5,401 released) and large salmon was 1,892 (326 retained and 1,566 released). The proportion of salmon released by anglers in Labrador, which has been increasing over time, was 76% of the total catch, and was the highest value reported to date. In total, there were 6,967 small and large salmon reported to have been hooked and released in 2001 (Tables 1-4).

Food fisheries data

In 2001, the following preliminary landings of salmon were reported for the food fisheries in Labrador:

	Small salmon		Large salmon		Total	
	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)
Northern Labrador & Lake Melville (SFA 1)						
LIA	2,573	5,227	1,134	4,446	3,707	9,673
Innu	686	1,480	138	553	840	2,032
Resident	135	288	27	123	161	411
Total	3,394	6,995	1,299	5,121	4,708	12,117
Southern Labrador (SFA 2)						
Resident	1,396	2,793	374	1,378	1,770	4,172
TOTAL	4,789	9,789	1,673	6,499	6,478	16,288

In total, there were about 6,500 salmon reported by food fisheries in Labrador with a total weight of 16,290 kg, which is an increase of almost 700 kg over 2000. This increase was largely due to a small increase in the proportion of large salmon in the landings, which are heavier. Reporting rates for the various fisheries were 100% for the Innu Nation food fishery in Sheshatshiu, 71% for the LIA food fishery and 79% for the resident food fishery.

In 2001, preliminary landing information is also available for charr and trout from the Resident Food Fishery:

	Charr		Trout	
SFA	Number	Weight (kg)	Number	Weight (kg)
1	76	92	3,489	2,433
2	5,147	5,157	10,467	7,648
Total	5,223	5,248	13,956	10,080

In total, there were 5,223 charr and 13,956 brook trout landed in the resident food fishery in Lake Melville (SFA 1) and southern Labrador (SFA 2). The response rate for the logbooks was 79%. The total numbers of charr and trout landed in Labrador are unknown as there is no reporting system for fish caught either through the ice in the winter/spring or by recreational fishing in summer.

Total returns to rivers

Total returns of small and large salmon are listed in Table 5 for those years of available data. On the rivers with time series information, declines were observed for small and large salmon on Forteau Brook (1994-97), increasing small salmon for Sand Hill River (1970-73 & 1994-96) and increasing trends for small salmon at Southwest Brook (Paradise River, 1998-99), while large salmon declined on Sand Hill River and Southwest Brook. In 2001, small and large salmon decreased on Southwest Brook compared to counts in 1998-99, but in the presence of the Resident Food Fishery, while at English River (1999-2001), counts of small salmon declined over 2000 while large salmon increased.

Environmental data

Daily water flows on Alexis River at the June 1 in 2001 were lower than mean and maximum flows, dropping quickly to slightly above minimum flows except for a sharp increase in mid-July. During August and September, water flow was below average but mainly above minimum values (Fig. 2). Daily water flows on Eagle River in 2001 were about average on the June 1 declining below average but remaining above minimum flows until about July 15 when they increased sharply to above average, remaining so until the end of August, after which they declined to below the average (Fig. 3). Daily flow conditions on Ugjotok River in 2001 were below average on June 15 and remained below average for much of the summer, increasing to above average for some of August and September (Fig. 4).

Salmon Rivers in Labrador

Anderson (1985) lists 120 rivers in Labrador from the southern border with Quebec to Cape Chidley. A summary is provided here along with estimates of rearing and drainage areas for all salmon rivers in Labrador including some omitted by Anderson (1985). There are some rivers that were left out of this list, i.e. Port Marnham Brook, Barge Bay Brook, and Southwest Tributary of White Bear River. Of these, there

currently are about 81 rivers with salmon that have a drainage area bigger than about 50 km^2. Some of these rivers have only salmon in them whereas others have a mix of brook trout and Arctic charr. The survey information from these rivers are detailed in Table 6.

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Table 1. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 1, Labrador, 1974-2001. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>=63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	801	347	.	347	311	.	311	658	.	658	0.82
1975	245	379	.	379	117	.	117	496	.	496	2.02
1976	928	891	.	891	368	.	368	1259	.	1259	1.36
1977	809	688	.	688	533	.	533	1221	.	1221	1.51
1978	704	875	.	875	432	.	432	1307	.	1307	1.86
1979	1367	905	.	905	430	.	430	1335	.	1335	0.98
1980	780	704	.	704	232	.	232	936	.	936	1.20
1981	422	669	.	669	195	.	195	864	.	864	2.05
1982	831	834	.	834	379	.	379	1213	.	1213	1.46
1983	834	488	.	488	137	.	137	625	.	625	0.75
1984	1074	702	.	702	222	.	222	924	.	924	0.86
1985	946	642	.	642	135	.	135	777	.	777	0.82
1986	741	421	.	421	129	.	129	550	.	550	0.74
1987	1011	854	.	854	141	.	141	995	.	995	0.98
1988	1629	1278	.	1278	171	.	171	1449	.	1449	0.89
1989	1296	1269	.	1269	144	.	144	1413	.	1413	1.09
1990	1245	563	.	563	115	.	115	678	.	678	0.54
1991	1056	130	.	130	8	.	8	138	.	138	0.13
1992	899	283	29	312	335	0	335	618	29	647	0.72
1993	422	121	124	245	22	25	47	143	149	292	0.69
1994	1036	453	933	1386	114	96	210	567	1029	1596	1.54
1995	880	500	854	1354	92	97	189	592	951	1543	1.75
1996	879	260	62	322	50	17	67	310	79	389	0.44
1997	1266	300	133	433	46	25	71	346	158	504	0.40
1998	813	256	448	704	61	109	170	317	557	874	1.08
1999	954	350	353	703	109	97	206	459	450	909	0.95
2000	1103	363	801	1164	79	232	311	442	1033	1475	1.34
2001	962	352	681	1033	75	130	205	427	811	1238	1.29
84-89 $\bar{X}$	1116.2	861.0	.	861.0	157.0	.	157.0	1018.0	.	1018.0	0.91
95% CL	324.5	365.8	.	365.8	36.7	.	36.7	372.1	.	372.1	0.12
N	6	6	0	6	6	0	6	6	0	6	6
86-91 $\bar{X}$	1163.0	752.5	.	752.5	118.0	.	118.0	870.5	.	870.5	0.75
95% CL	316.4	489.3	.	489.3	59.8	.	59.8	539.5	.	539.5	0.36
N	6	6	0	6	6	0	6	6	0	6	6
92-00 $\bar{X}$	916.9	320.7	415.2	735.9	100.9	77.6	178.4	421.6	492.8	914.3	1.00
95% CL	178.4	86.8	278.8	351.6	71.4	55.1	79.4	120.7	322.9	391.9	0.40
N	9	9	9	9	9	9	9	9	9	9	9

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-2001 AND ON RETAINED FISH ONLY PRIOR TO 1992.

Table 2. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 2, Labrador, 1974-2001. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	1978	1414	.	1414	201	.	201	1615	.	1615	0.82
1975	1784	2524	.	2524	56	.	56	2580	.	2580	1.45
1976	2331	2337	.	2337	152	.	152	2489	.	2489	1.07
1977	2507	2244	.	2244	160	.	160	2404	.	2404	0.96
1978	3131	1243	.	1243	152	.	152	1395	.	1395	0.45
1979	1817	2312	.	2312	60	.	60	2372	.	2372	1.31
1980	1692	2158	.	2158	320	.	320	2478	.	2478	1.46
1981	1423	2824	.	2824	105	.	105	2929	.	2929	2.06
1982	2290	1999	.	1999	162	.	162	2161	.	2161	0.94
1983	2294	1884	.	1884	161	.	161	2045	.	2045	0.89
1984	2057	1246	.	1246	103	.	103	1349	.	1349	0.66
1985	1756	1367	.	1367	59	.	59	1426	.	1426	0.81
1986	2310	1972	.	1972	154	.	154	2126	.	2126	0.92
1987	2750	2625	.	2625	277	.	277	2902	.	2902	1.06
1988	2875	2653	.	2653	288	.	288	2941	.	2941	1.02
1989	2986	2242	.	2242	264	.	264	2506	.	2506	0.84
1990	2607	1680	.	1680	144	.	144	1824	.	1824	0.70
1991	2427	1041	.	1041	36	.	36	1077	.	1077	0.44
1992	2813	1599	158	1757	208	10	218	1807	168	1975	0.70
1993	3600	1340	1255	2595	114	36	150	1454	1291	2745	0.76
1994	3352	1511	1716	3227	259	184	443	1770	1900	3670	1.09
1995	3544	1280	1727	3007	246	219	465	1526	1946	3472	0.98
1996	6271	1991	2610	4601	255	296	551	2246	2906	5152	0.82
1997	5256	1729	1264	2993	152	118	270	1881	1382	3263	0.62
1998	5050	1628	2273	3901	242	356	598	1870	2629	4499	0.89
1999	5607	1531	2804	4335	229	452	681	1760	3256	5016	0.89
2000	4664	1398	3851	5249	338	470	808	1736	4321	6057	1.30
2001	4247	1015	2605	3620	251	844	1095	1266	3449	4715	1.11
84-89 $\bar{X}$	2455.7	2017.5	.	2017.5	190.8	.	190.8	2208.3	.	2208.3	0.90
95% CL	517.1	637.4	.	637.4	103.6	.	103.6	736.8	.	736.8	0.15
N	6	6	0	6	6	0	6	6	0	6	6
86-91 $\bar{X}$	2659.2	2035.5	.	2035.5	193.8	.	193.8	2229.3	.	2229.3	0.84
95% CL	273.8	645.5	.	645.5	104.6	.	104.6	747.9	.	747.9	0.23
N	6	6	0	6	6	0	6	6	0	6	6
92-00 $\bar{X}$	4461.9	1556.3	1962.0	3518.3	227.0	237.9	464.9	1783.3	2199.9	3983.2	0.89
95% CL	907.0	166.8	822.1	840.2	49.7	129.6	169.3	173.9	944.4	996.4	0.16
N	9	9	9	9	9	9	9	9	9	9	9

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-2001 AND ON RETAINED FISH ONLY PRIOR TO 1992.

Table 3. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 14B, Labrador, 1974-2001. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	2713	740	.	740	291	.	291	1031	.	1031	0.38
1975	2180	1069	.	1069	154	.	154	1223	.	1223	0.56
1976	3896	2498	.	2498	310	.	310	2808	.	2808	0.72
1977	3918	1662	.	1662	593	.	593	2255	.	2255	0.58
1978	2413	573	.	573	183	.	183	756	.	756	0.31
1979	2149	901	.	901	119	.	119	1020	.	1020	0.47
1980	2476	938	.	938	337	.	337	1275	.	1275	0.51
1981	3353	1698	.	1698	220	.	220	1918	.	1918	0.57
1982	3279	1271	.	1271	80	.	80	1351	.	1351	0.41
1983	3529	2000	.	2000	130	.	130	2130	.	2130	0.60
1984	3997	987	.	987	185	.	185	1172	.	1172	0.29
1985	3664	1092	.	1092	100	.	100	1192	.	1192	0.33
1986	4643	1071	.	1071	184	.	184	1255	.	1255	0.27
1987	4993	1887	.	1887	215	.	215	2102	.	2102	0.42
1988	5707	1592	.	1592	251	.	251	1843	.	1843	0.32
1989	4895	1173	.	1173	53	.	53	1226	.	1226	0.25
1990	5075	1066	.	1066	98	.	98	1164	.	1164	0.23
1991	4017	1152	.	1152	49	.	49	1201	.	1201	0.30
1992	4630	856	64	920	238	0	238	1094	64	1158	0.25
1993	5296	1047	414	1461	242	30	272	1289	444	1733	0.33
1994	4117	659	506	1165	78	50	128	794	97	891	0.15
1995	3618	761	443	1204	82	155	237	1025	311	1336	0.25
1996	4348	900	1123	2023	74	148	222	900	1271	2171	0.50
1997	3440	730	761	1491	*	418	418	730	1179	1909	0.55
1998	3534	864	1109	1973	*	351	351	864	1460	2324	0.66
1999	2109	397	825	1222	*	338	338	397	1163	1560	0.74
2000	3923	677	2001	2678	*	705	705	677	2706	3383	0.86
2001**	3489	562	2115	2677	*	592	592	562	2707	3269	0.94
84-89 $\bar{X}$	4649.8	1300.3	.	1300.3	164.7	.	164.7	1465.0	.	1465.0	0.32
95% CL	770.4	375.4	.	375.4	77.7	.	77.7	422.5	.	422.5	0.07
N	6	6	0	6	6	0	6	6	0	6	6
86-91 $\bar{X}$	4888.3	1323.5	.	1323.5	141.7	.	141.7	1465.2	.	1465.2	0.30
95% CL	581.7	354.9	.	354.9	90.9	.	90.9	422.5	.	422.5	0.07
N	6	6	0	6	6	0	6	6	0	6	6
92-00 $\bar{X}$	4290.1	775.7	734.4	1510.1	87.7	231.7	319.3	863.3	966.1	1829.4	0.43
95% CL	910.3	140.4	481.1	472.8	85.7	183.5	133.6	199.1	649.9	572.5	0.19
N	9	9	9	9	9	9	9	9	9	9	9

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-95 AND ON RETAINED FISH ONLY PRIOR TO 1992.

*NOT ALLOWED TO RETAIN LARGE SALMON IN SFA 14B, 1997-2001.

**DATA OBTAINED FROM THE LICENSE STUB RETURN (2001 DATA ARE PRELIMINARY).

Table 4. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Areas 1,2 & 14B, Labrador, 1974-2001. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (>= 63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1974	5492	2501	.	2501	803	.	803	3304	.	3304	0.60
1975	4209	3972	.	3972	327	.	327	4299	.	4299	1.02
1976	7155	5726	.	5726	830	.	830	6556	.	6556	0.92
1977	7234	4594	.	4594	1286	.	1286	5880	.	5880	0.81
1978	6248	2691	.	2691	767	.	767	3458	.	3458	0.55
1979	5333	4118	.	4118	609	.	609	4727	.	4727	0.89
1980	4948	3800	.	3800	889	.	889	4689	.	4689	0.95
1981	5198	5191	.	5191	520	.	520	5711	.	5711	1.10
1982	6400	4104	.	4104	621	.	621	4725	.	4725	0.74
1983	6657	4372	.	4372	428	.	428	4800	.	4800	0.72
1984	7128	2935	.	2935	510	.	510	3445	.	3445	0.48
1985	6366	3101	.	3101	294	.	294	3395	.	3395	0.53
1986	7694	3464	.	3464	467	.	467	3931	.	3931	0.51
1987	8754	5366	.	5366	633	.	633	5999	.	5999	0.69
1988	10211	5523	.	5523	710	.	710	6233	.	6233	0.61
1989	9177	4684	.	4684	461	.	461	5145	.	5145	0.56
1990	8927	3309	.	3309	357	.	357	3666	.	3666	0.41
1991	7500	2323	.	2323	93	.	93	2416	.	2416	0.32
1992	8342	2738	251	2989	781	10	791	3519	261	3780	0.45
1993	9318	2508	1793	4301	378	91	469	2886	1884	4770	0.51
1994	8505	2623	3155	5778	451	330	781	3131	3026	6157	0.72
1995	8042	2541	3024	5565	420	471	891	3143	3208	6351	0.79
1996	11498	3151	3795	6946	379	461	840	3456	4256	7712	0.67
1997	9962	2759	2158	4917	198	561	759	2957	2719	5676	0.57
1998	9397	2748	3830	6578	303	816	1119	3051	4646	7697	0.82
1999	8670	2278	3982	6260	338	887	1225	2616	4869	7485	0.86
2000	9690	2438	6653	9091	417	1407	1824	2855	8060	10915	1.13
2001**	8698	1929	5401	7330	326	1566	1892	2255	6967	9222	1.06
84-89 $\bar{X}$	8222	4179	.	4179	513	.	513	4691	.	4691	0.56
95% CL	1490	1214	.	1214	153	.	153	1336	.	1336	0.08
N	6	6	0	6	6	0	6	6	0	6	6
86-91 $\bar{X}$	8711	4112	.	4112	454	.	454	4565	.	4565	0.52
95% CL	1051	1341	.	1341	229	.	229	1557	.	1557	0.14
N	6	6	0	6	6	0	6	6	0	6	6
92-00 $\bar{X}$	9278	776	734	1510	88	232	319	863	966	1829	0.43
95% CL	1111	140	481	473	86	184	134	199	650	573	0.19
N	9	9	9	9	9	9	9	9	9	9	9

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1992-95 AND ON RETAINED FISH ONLY PRIOR TO 1992.
*NOT ALLOWED TO RETAIN LARGE SALMON IN SFA 14B, 1997-2001.
**DATA OBTAINED FROM THE LICENSE STUB RETURN (2001 DATA ARE PRELIMINARY).

Table 5. Summary of total returns to rivers in Labrador. Total returns include angling catches below counting facilities plus count from counting fence or mark-recapture population estimate.

	Forteau Brook		Pinware River		Sand Hill River		Paradise River & Southwest Brook				Big Brook		English River	
Year	Small	Large	Small	Large	Small	Large	Small	Large	Small	Large	Small	Large	Small	Large
1970	-	-	-	-	3600	138	-	-	-	-	-	-	-	-
1971	-	-	-	-	3596	266	-	-	-	-	-	-	-	-
1972	-	-	-	-	2038	175	-	-	-	-	-	-	-	-
1973	-	-	-	-	4761	504	-	-	-	-	-	-	-	-
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1994	458	77	-	-	2180	730	-	-	-	-	-	-	-	-
1995	461	147	-	-	2796	560	-	-	-	-	-	-	-	-
1996	-	-	-	-	3319	414	-	-	-	-	-	-	-	-
1997	223	56	874	179	-	-	-	-	-	-	530	104	-	-
1998	-	-	-	-	-	-	-	-	110	4	-	-	-	-
1999	-	-	-	-	-	-	4681	491	331	43	790	194	59	48
2000	-	-	-	-	-	-	-	-	-	-	982	151	367	15
2001	-	-	-	-	-	-	-	-	323	32	-	-	224	41

Table 6 Drainage areas, parr habitat and potential adult production for Labrador rivers (Anderson 1985) Drainage area and habitat measured using 1:250 000 scale maps
Numbers in bold type are estimated from SFA totals (1) indicates that drainage basin has been re-surveyed and is different than in Anderson (1985)
Rivers in bold italics have angling data for some years but not necessarily all years

No.	River	SFA	Region	Total Watershed Drainage (km2)		Parr rearing habitat		Potential adult production	Comments
				Total	Accessible	Accessible (units)	Inaccessible (units)		
1	***Forteau Brook***	14B	Straits shore	389	220	1426	1097	5000	Uses text value of adult production, Anderson (1985) habitat & obstructions survey
2	***Lance aux Loup Brook***	14B	Straits shore	130	94	986	359	281	Anderson (1985) habitat & obstructions survey in 1975
3	***Pinware River***	14B	Straits shore	2627	2133	46691	10808	14007	Anderson (1985) habitat & obstructions survey in 1975
	Subtotal SFA 14B	**14B**	**Straits shore**	**3146**	**2447**	**49053**	**12264**	**19288**	
4	Temple Brook	2	Southern	181	90	2311	***1184***	693	75% estimated inaccessible from fig. 7, Anderson (1985) habitat & obstructions survey
5	St. Peters River	2	Southern	140	16	65	510	20	Anderson (1985) habitat & obstructions survey in 1975
6	***St. Charles River***	2	Southern	311	311	6237	0	1871	Anderson (1985) habitat & obstructions survey in 1975
7	***Mary's Hr River***	2	Southern	414	414	6526	0	1958	Anderson (1985) habitat & obstructions survey in 1975
8	***St. Lewis River***	2	Southern	2590	717	13723	35814	4117	Anderson (1985) habitat & obstructions survey in 1975
9	Notleys Brook	2	Southern	46	46	***594***	***0***	***178***	No habitat or obstructions survey, assumed 100% accessible
10	Bobbys Brook	2	Southern	245	167	1360	641	408	Anderson (1985) habitat & obstructions survey in 1975
11	***Alexis River***	2	Southern	3160	926	8919	21522	2676	Anderson (1985) habitat & obstructions survey in 1975
12	***Shinneys Waters***	2	Southern	313	313	1020	0	306	Anderson (1985) habitat & obstructions survey in 1975
13	***Gilbert River***	2	Southern	642	0	0	3238	0	Murphy (1972) habitat & obstructions surveys
14	Seven Mile Pond River (Riv	2	Southern	98	98	2128	0	638	Murphy (1972) habitat & obstructions surveys
15	***White Bear Arm River***	2	Southern	233	233	4053	0	1216	Murphy (1972) habitat & obstructions surveys
16	River 16	2	Southern	45	45	833	0	250	Murphy (1972) habitat & obstructions surveys
17	***Hawke River***	2	Southern	1891	1891	46366	0	13910	Murphy (1972) habitat & obstructions surveys
18	Caplin Bay Brook	2	Southern	150	150	1591	0	477	Murphy (1972) habitat & obstructions surveys
19	Partridge Bay Brook	2	Southern	70	70	872	0	262	Murphy (1972) habitat & obstructions surveys
20	Shoal Bay River 20	2	Southern	119	119	1067	0	320	Murphy (1972) habitat & obstructions surveys
21	Shoal Bay Brook	2	Southern	18	18	581	0	174	Murphy (1972) habitat & obstructions surveys
22	River 22	2	Southern	13	13	340	0	102	Murphy (1972) habitat & obstructions surveys
23	Black Bear River	2	Southern	645	645	7921	0	2376	Murphy (1972) habitat & obstructions surveys
24	Open Bay Brook	2	Southern	39	39	360	0	108	Murphy (1972) habitat & obstructions surveys
25	Porcupine Harbour River	2	Southern	155	33	368	1381	110	Murphy (1972) habitat & obstructions surveys
26	River 26	2	Southern	70	70	252	0	76	Murphy (1972) habitat & obstructions surveys
27	Reeds Pond Brook	2	Southern	233	233	3175	0	953	Murphy (1972) habitat & obstructions surveys
28	***Sand Hill River (1)***	2	Southern	1618	1456	***18791***	***2088***	***5637***	No habitat survey, 10% is estimated to be inaccessible from 1997 survey
29	Muddy Bay Brook	2	Southern	337	337	***4369***	***0***	***1305***	No habitat survey, obstructions survey by Peet (1971)
30	Paradise River (1)	2	Southern	5664	5664	56425	0	16928	Murphy (1971) habitat & obstructions surveys
31	***Eagle River***	2	Southern	10824	9793	111516	***5576***	***33456***	No adults listed, prorated from Paradise R, 95% accessible (estimated), habitat & obstructions survey (Murphy 1971, 1972)
32	Southwest Brook	2	Southern	525	525	***6775***	***0***	***2032***	No habitat or obstructions survey
33	***White Bear River***	2	Southern	1021	1021	22228	0	6668	Murphy (1971) habitat & obstructions surveys
34	North River (1)	2	Southern	2215	2215	***28583***	***0***	***8575***	Peet (1971) obstructions survey, no habitat survey
	Subtotal SFA 2	**2**	**Southern**	**34025**	**27667**	**367016**	**71953**	**107800**	

Table 6. cont'd

35	Flatwater Brook	1	Lake Melville	299	299	*5116*	*0*	*1535*	Peet (1971) obstructions survey, no habitat survey
36	English River	1	Lake Melville	640	33	662	12286	199	Murphy & Porter (1974) habitat & obstructions surveys
37	Kenemich River	1	Lake Melville	699	699	11570	0	3471	Murphy & Porter (1974) habitat & obstructions surveys
38	Kenamu River	1	Lake Melville	4403	4403	*75331*	*0*	16500	No habitat survey, Riche (1965) for adult estimate & obstructions
39	Traverspine River	1	Lake Melville	728	613	19749	3714	5925	Murphy & Porter (1974) habitat & obstructions surveys
40	Churchill River	1	Lake Melville	93415	1062	*18170*	*1580067*	*5451*	No habitat survey, obstructions surveyed by Nfld Hydro
41	Goose River	1	Lake Melville	3432	1938	33560	25865	10068	Murphy (1973) habitat & obstructions surveys
42	Cape Caribou River	1	Lake Melville	546	546	14922	0	4477	Murphy & Porter (1974) habitat & obstructions surveys
43	Beaver River	1	Lake Melville	1878	1624	46251	7245	13875	Murphy & Porter (1974) habitat & obstructions surveys
44	Susan River	1	Lake Melville	363	363	11166	0	3350	Murphy & Porter (1974) habitat & obstructions surveys
45	Naskaupi River	1	Lake Melville	12691	1269	*21713*	*195417*	*6514*	No habitat survey, 10% inaccessible estimated from Anderson (1985), obstructions surveyed by Riche (1965)
46	Crooked River	1	Lake Melville	2391	2391	46836	0	14051	Murphy & Porter (1974) habitat & obstructions surveys
47	Sebaskachu River	1	Lake Melville	580	580	1893	0	568	Murphy & Porter (1974) habitat & obstructions surveys
48	Mulligan River	1	Lake Melville	1062	1062	9902	0	2971	Murphy (1972) habitat & obstructions surveys
49	***Double Mer***	1	Northern	1425	1425	19502	0	5851	Murphy (1972) habitat & obstructions surveys
50	River 49	1	Northern	855	855	18635	0	5591	Murphy (1972) habitat & obstructions surveys
51	***Tom Luscombe Brook***	1	Northern	1010	1010	*17280*	*0*	*5184*	Peet (1971) obstructions survey, no habitat survey
52	West Brook	1	Northern	149	149	*2549*	*0*	*765*	Peet (1971) obstructions survey, no habitat survey
53	Middle Brook	1	Northern	323	323	*5526*	*0*	*1658*	Peet (1971) obstructions survey, no habitat survey
54	53/54 Pottles Bay River	1	Northern	135	135	*2310*	*0*	*693*	Peet (1971) obstructions survey, no habitat survey
55	55 Byron Bay River	1	Northern	163	163	*2789*	*0*	*837*	No habitat or obstructions surveys
56	***Big Brook (Michaels Riv***	1	Northern	793	793	22059	0	6618	Murphy (1973) habitat & obstructions surveys
57	Jeanette Bay Brook	1	Northern	67	67	1523	0	457	Murphy (1973) habitat & obstructions surveys
58	River 58	1	Northern	13	13	*222*	*0*	*67*	No habitat or obstructions surveys
59	Tukialik River	1	Northern	47	47	684	0	205	Murphy (1973) habitat & obstructions surveys
60	Pamiulik River	1	Northern	493	493	14882	0	4465	Murphy (1973) habitat & obstructions surveys
61	Stag Bay Brook	1	Northern	155	155	4760	0	1428	Murphy (1973) habitat & obstructions surveys
62	Rattling Brook	1	Northern	265	265	11308	0	3392	Murphy (1973) habitat & obstructions surveys
63	***Big River***	1	Northern	2649	2849	10879	0	3264	Murphy (1973) habitat & obstructions surveys
64	Adlavik River	1	Northern	233	233	7186	0	2156	Murphy (1973) habitat & obstructions surveys
65	River 65	1	Northern	39	39	533	0	160	Murphy (1973) habitat & obstructions surveys
66	River 66	1	Northern	29	29	*496*	*0*	*149*	Murphy obstructions survey (unpublished), no habitat survey
67	Makkovik Brook	1	Northern	111	90	2179	520	654	Murphy (1973) habitat & obstructions surveys
68	Makkovik Rook	1	Northern	259	259	5231	0	1569	Murphy (1973) habitat & obstructions surveys
69	South Brook	1	Northern	399	399	3270	0	981	Murphy (1973) habitat & obstructions surveys
70	Kaipokok River	1	Northern	2499	2242	24006	2756	7202	Murphy (1973) habitat & obstructions surveys
71	English River	1	Northern	326	326	10105	0	3032	Murphy (1973) habitat & obstructions surveys
72	River 72	1	Northern	399	399	840	0	252	Murphy (1973) habitat & obstructions surveys
73	Kanairiktok River	1	Northern	12274	0	0	133109	0	Murphy (1973) habitat & obstructions surveys
74	Little Bay River	1	Northern	244	244	*4175*	*0*	*1252*	No habitat or obstructions surveys assumed 100% accessible
75	River 75	1	Northern	475	475	*8127*	*0*	*2438*	No habitat or obstructions surveys assumed 100% accessible
76	***Adlatok (Ugjoktok) Rive***	1	Northern	11106	8070	130000	48918	39000	Murphy (1973) habitat & obstructions surveys
77	***Hunt River***	1	Northern	1344	1344	24657	0	7397	Murphy & Porter (1974) habitat & obstructions surveys
78	River 78	1	Northern	338	338	*5783*	*0*	*1735*	No habitat or obstructions surveys assumed 100% accessible
79	***Flowers River***	1	Northern	1443	1443	29084	0	8725	Murphy & Porter (1974) habitat & obstructions surveys
80	Rivers 80/81	1	Northern	310	310	*5304*	*0*	*1591*	No habitat or obstructions surveys assumed 100% accessible
81	Sango Brook	1	Northern	806	685	15561	2745	4668	No habitat or obstructions surveys assumed 100% accessible
	Subtotal SFA 1			**164523**	**42567**	**728285**	**2012642**	**212390**	
	Total			**201694**	**72682**	**1134354**	**2096860**	**339478**	

Fig. 1. Labrador showing locations of Salmon Fishing Areas and rivers mentioned in the text.

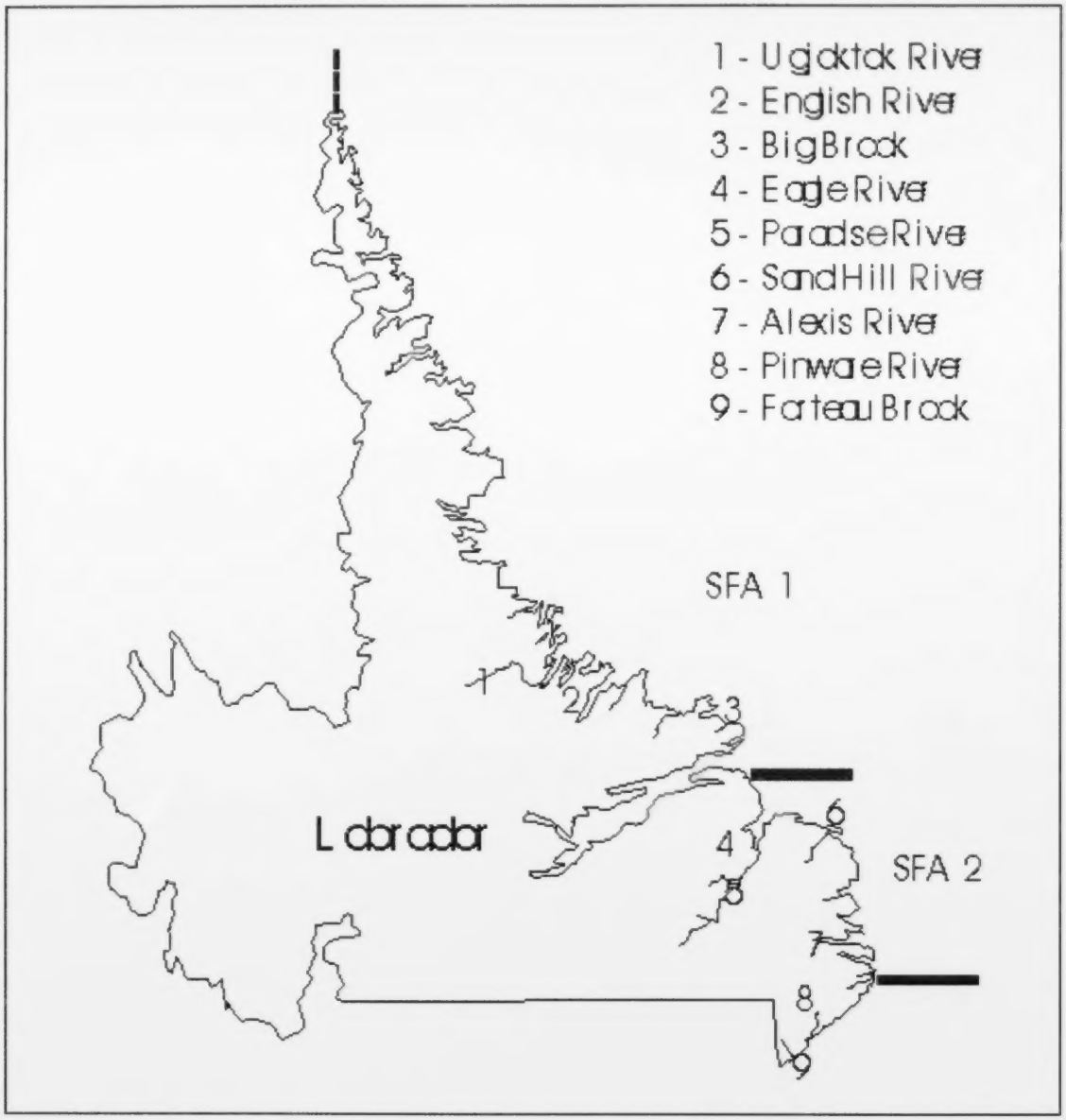

Fig. 2. Alexis River Flow Data, 1978-97 & 2001

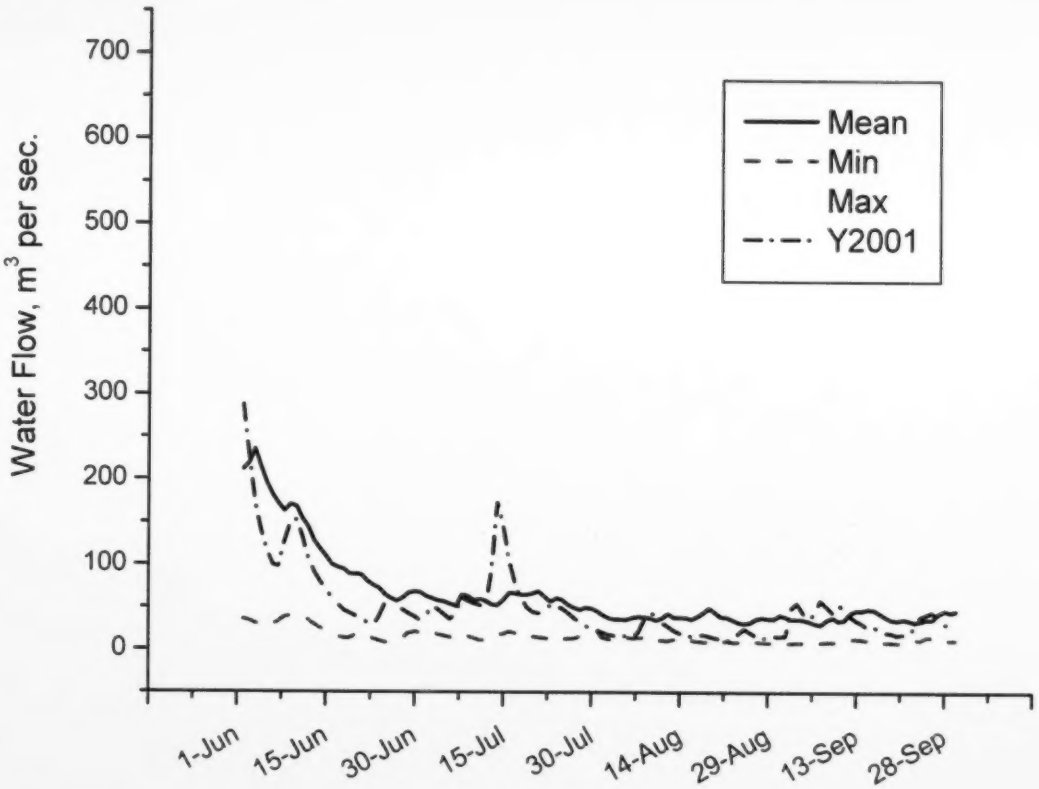

Fig. 3. Eagle River Flow Data, 1967-97 & 2001

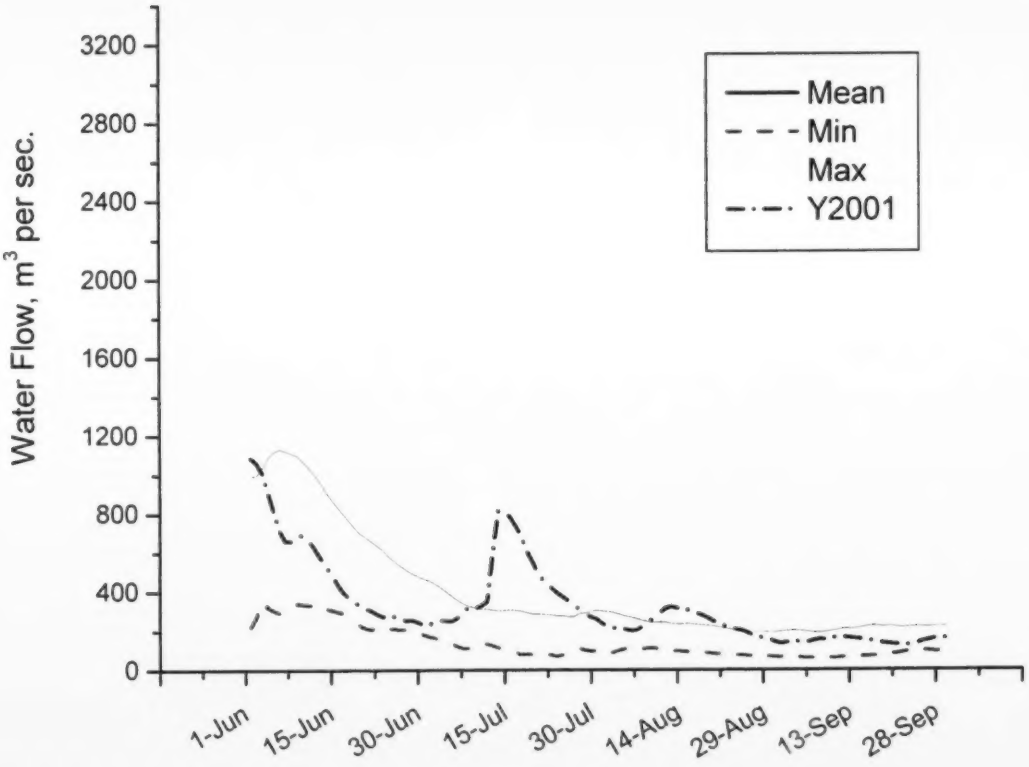

Fig. 4. Ugjoktok River, 1979-97 & 2001